

REMARKS

Claims 1-6 and 8-17 and 22-35 are pending in the Office Action, with claims 1, 9, 22, 30, 31, 32, and 34 being the independent claims. Claim 7 is canceled. Claims 1, 8, 9, 22, 25-27, 30, and 31 are amended.

Rejections Under 35 U.S.C. § 112

The Office Action rejected claims 1-31 under 35 U.S.C. § 112 as being indefinite. Claim 9 was rejected because “the mixing chamber flow” lacked antecedent basis. Applicants have amended claim 9 to recite “the mixing chamber being flow coupled” to more clearly define the invention. As now more clearly recited, Applicants are claiming that the mixing chamber is flow coupled to the first plurality of passages.

Claims 25 and 31 were rejected in the Office Action because “the characteristic factor” lacked antecedent basis. Applicants have corrected this with respect to claim 25. Claim 31, however, does not recite “the characteristic factor.” Therefore, Applicants have not amended claim 31 in view of this rejection.

In claim 30, the Office Action requests clarification of the term “full-flow.” Applicants have amended claims 30 and 31 to recite “entire exhaust gas flow.” The term full-flow is not specifically used in the specification. Instead, the specification uses the term “entire exhaust gas flow” and refers to full dilution tunnel. See Specification, paragraphs 4, 36, and 42.

Claims 1, 9, 22, 26, and 27 were rejected for reciting that the flow or streams of gas are unobstructed. Applicants have amended these claims to further clarify that the flow or streams are unobstructed by structure.

Claims 25-27 are rejected for reciting the term “impinging.” As used herein, impinging is meant to cover the situation where the gas flows are introduced into the

mixing chamber in a direction where the gas stream of one gas does not directly cross the gas stream of the other gas. Such a system of “directing the first and second streams of gas in a manner that they avoid impinging on each other” is disclosed in Figs. 2 and 3, where the gas streams of each flow are introduced into the mixing chamber in the same direction. The gas streams do not cross each other, and therefore, they avoid impinging on each other as they enter the mixing chamber. For further clarity, Applicants have amended claims 25-27 to recite that the streams of gas avoid impinging on each other “as they enter the mixing chamber.”

In view of the amendments to the claims and the discussion above, Applicants respectfully request that all the rejections under 35 U.S.C. § 112 be withdrawn.

Rejections Under 35 U.S.C. § 102

The Office Action rejected claims 1, 4-6, 26, and 28 under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 3,913,617 to van Laar et al. (“van Laar”). By this Reply, Applicants amend claim 1 to include the features of original claim 7. Accordingly, claim 1 is not anticipated by van Laar. Claims 4-6, 26, and 28 depend from and add additional features to independent claim 1. Therefore, these claims are also not anticipated by van Laar. Applicants respectfully request that the Examiner withdraw the rejection.

Rejections Under 35 U.S.C. § 103

Claims 1, 2, 4-5, 7-10, 12-14, 17, and 22-35

The Office Action rejected claims 1, 2, 4-5, 7-10, 12-14, 17, and 22-35 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,604,319 to Kohsaka et al. (“Kohsaka”) in view of van Laar.

Kohsaka discloses that exhaust gas from an engine 1 is introduced into a dilution tunnel 3 via an exhaust pipe 2 (see Fig. 1), that air is drawn into the dilution tunnel 3 through an air filter 4, and that the diluted exhaust gas is then drawn through a venturi tube 6. See FIG. 1.

van Laar discloses a system for cooling a hot-blast flow with a cold air flow for a blast furnace. A first conduit 1 carries the hot-blast flow and a second conduit 2 carries the cold air flow. A ring main 3 and a plurality of pipe bends 4 connect the second conduit 2 to the first conduit 1. van Laar, column 2, line 62-column 3, line 4. In order to introduce the cold air flow into the hot-blast flow, the cold air is introduced into the first conduit, at a high velocity, perpendicular to the hot-blast flow, forcing the cold air deep into the hot-blast flow. See van Laar, column 2, lines 23-28 & 55-57. In order to further increase the velocity of the cold air flow, the flow cross-section of the pipe bends or discharge openings may be reduced. See van Laar, column 3, lines 31-36.

The combination of Kohsaka and van Laar does not render any of the rejected claims unpatentable because the combination fails to establish a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference(s) must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and must not be based on Applicants' disclosure. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). See MPEP § 2143.

The Office Action suggests combining Kohsaka and van Laar by modifying the exhaust pipe 2 of Kohsaka to include the ring main 3 and pipe bends 4 of van Laar and to terminate the modified exhaust pipe of Kohsaka at the wall of its dilution tunnel 3 as is allegedly taught in van Laar. Continuing, the Office Action states that it would be obvious to combine the passages of van Laar with the system of Kohsaka because van Laar teaches that a manifold may be employed to add two streams. See Office Action, pages 3-4.

However, Applicants respectfully submit that such a combination does not establish a *prima facie* case of obviousness because there is no teaching or suggestion in the art to modify Kohsaka and van Laar in the manner suggested. The ring main 3 and pipe bends 4 in van Laar are configured to introduce cold air into a hot-blast flow. The sampling device in Kohsaka is for testing emissions. It is well established that the teaching or suggestion to make the claimed combination must be found in the prior art, not based on Applicants' disclosure. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). See MPEP § 2143.

First, Kohsaka does not provide any suggestion or motivation to add the ring main and pipe bends of van Laar to the sides of its dilution tunnel in order to introduce its exhaust stream at its wall. In fact, Kohsaka alone would suggest that introducing the exhaust into the middle of the cross-section would be an ideal way to promote mixing.

Second, van Laar does not provide any suggestion or motivation to add its ring main and pipe bends to an emission sampling device, such as the one disclosed in Kohsaka. While van Laar does disclose mixing of cold air with a hot-blast flow, it does not provide any suggestion or motivation that would lead one skilled in the art to believe

that it could be used with equal success on an emission sampling device. In fact, it may not be used with equal success. van Laar discloses that to achieve a proper level of mixing, the cold air flow is blown into the first conduit at a high velocity, perpendicular to the hot-blast flow, forcing the cold air deep into the hot-blast flow. See van Laar, column 2, lines 23-28 & 55-57. The velocity may be further increased by further reducing the flow cross-section of the cold air or by adding nozzles. See van Laar, column 3, lines 31-36. However, while reducing the flow cross-section or adding nozzles might increase the velocity and thereby increase mixing, when used in an emission sampling device, such as is disclosed in Kohsaka, reducing the flow cross-section or adding nozzles may affect the operability of the engine being tested. For example, reducing the flow cross-section or adding nozzles would increase pressure in the engine exhaust system, resulting in emissions that are uncharacteristic of the engine. This would skew the results of any sampling by the system.

Therefore, van Laar teaches that when its cold air conduits terminate at the walls of the hot-blast flow conduit, the cold air is required to be introduced at a high velocity to achieve proper mixing. On the other hand, Kohsaka would suggest that proper mixing is achieved by introducing the exhaust gas into the middle of its dilution tunnel, rather than at the side of its dilution tunnel. These teachings together do not provide a suggestion or motivation to one skilled in the art to combine the teachings in a manner that renders the claims unpatentable because to replace Kohsaka's exhaust pipe with the cold air conduits of van Laar would require that the exhaust be introduced to the dilution tunnel at a high velocity to achieve proper mixing. And introducing the exhaust gas at a high velocity is unacceptable because it would increase the pressure in the

exhaust pipe, thereby affecting the emissions from the associated engine and skewing any results obtained from the emissions sampling device of Kohsaka. Therefore, neither of these references provides a satisfactory suggestion or motivation to combine and modify them in a manner that would render the claims unpatentable. Because there is no suggestion or motivation, the rejected claims should be allowable over the combination of Kohsaka and van Laar.

Claims 3, 6, and 15

The Office Action rejected claims 3, 6, and 15 under 35 U.S.C. § 103(a) as being unpatentable over Kohsaka in view of van Laar and further in view of U.S. Patent No. 5,090,258 to Yamasaki *et al.* ("Yamasaki"). Claims 3, 6, and 15 depend from and add additional features to independent claims 1 and 9. Therefore, these claims are allowable for at least the reasons discussed above. Applicants respectfully request that the Examiner reconsider and withdraw the rejection.

Claims 32-35

The Office Action rejected claims 32-35 under 35 U.S.C. § 103(a) as being unpatentable over Kohsaka in view of van Laar and further in view of Yamasaki. Claims 32 and 34 are independent claims. The Office Action rejects claims 32-35 based on the same reasoning that the claims are unpatentable in view of Kohsaka and van Laar. For the reasons set forth above, there is no suggestion or motivation in the art to combine Kohsaka and van Laar in the manner taught in the Office Action. In addition, the office Action, relies upon Yamasaki for the teaching of a flow rectifying plate. The Office Action states that it would have been obvious to employ a flow-rectifying plate between Kohsaka's filter and inlet for exhaust 2 because Yamasaki teaches that such a plate

effectively transmits dilution air into a mixer and also results in a well developed flow of the dilution gas. See Office Action, pages 5-6.

However, the art does not provide any suggestion or motivation for such a modification. The teaching or suggestion to make the claimed combination must be found in the prior art and must not be based on Applicant's disclosure. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). See MPEP § 2143. There is no indication in Kohsaka that the open passage does not "effectively transmit dilution air into a mixer." Indeed, it would seem that, without any other reasoning, that the flow rectifying plate would inhibit transmission of air into the mixer in Kohsaka when compared to the already open dilution tunnel. Therefore, Kohsaka does not provide any suggestion or motivation for combining the flow rectifying plate into its dilution tunnel. Likewise, Yamasaki does not provide any suggestion or motivation for such a change. While Yamasaki provides the flow rectifying plate 13 between its inlet pipe 4 and a valve 24, it does not disclose any reasoning or benefit from doing so. Instead, it appears that the Office Action relies upon the reasoning that because a flow rectifier exists, it could therefore be used in the system of Kohsaka. Such reasoning does not rise to the level of a *prima facie* case of obviousness because it can only be based on improper hindsight reasoning, where the suggestion to combine could not be made without the benefit of the teachings of the present application. When such reliance on the teachings of the application is necessary to guide the combination of the art, the claims must be found to be allowable.

Claims 33 and 35 depend from and add additional features to independent claims 32 and 34. Therefore, these claims are allowable for at least the reasons

discussed above. Applicants respectfully request that the Examiner reconsider and withdraw the rejection.

Claim 11

The Office Action rejected claim 11 under 35 U.S.C. § 103(a) as being unpatentable over Kohsaka in view of van Laar and further in view of U.S. Patent No. 6,293,161 to Hanashiro et al. and in view of U.S. Patent No. 6,114,178 to Dezael et al. Claim 11 depends from and adds additional features to independent claim 9. Therefore, claim 11 is allowable for at least the reasons that claim 9 is allowable.

Double Patenting

Applicants acknowledge that claims 1, 3, 5, 6, 9, and 15 stand rejected under the judicially created doctrine of double patenting over claim 4 of U.S. Patent No. 6,684,719. Accordingly, when the claims are allowed, Applicants will file a terminal disclaimer addressing the double patenting rejection.

Conclusion

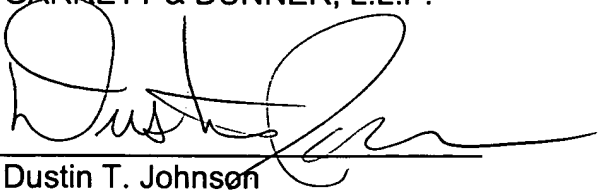
In view of the foregoing amendments and remarks, Applicants respectfully submits that claims 1-6, 8-17, and 22-35 are in a condition for allowance. Each statutory rejection has been overcome or rendered moot by this Reply. Accordingly, Applicants respectfully request reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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